

W3

To Prabha

QP95

28

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Electronics

1. PPI display stands for

- a. pulse position integration
- *b. plan position indicator
- c. peak pulse indicator
- d. none of the above

(b)

2. minimum number of flip flops required to build a modulo-10 counter is

- a. 10
- b. 5
- *c. 4
- d. 2 flip flops

(c)

3. a superheterodyne receiver has been tuned to receive a signal frequency at 1400 khz. During testing, it was noticed that the image frequency of 2300 khz was also being received. Therefore

it can be guessed that the receiver intermediate frequency is

- a. 900khz
- b. 3700khz
- c. 1850khz
- *d. 450khz

4. a electro dynamic instrument which responds to the average value of a wave form is connected across a 220v ac outlet. you expect the meter to read:

- a. 154v
- b. 110v
- c. 198v
- d. 314v

5. if a waveguide with internal dimension of 5x3.5cm is used to carry a 10ghz signal, the guide

wave length of the dominant TE mode of propagation would be:

a. 3.58cm b. 3.14cm c. 5.14cm d. 4.6cm for answer see kennedy book

6. in the 8085, asserting the RESET IN input causes:

- a. the accumulator to be set to zero
- b. the program counter to be set to zero
- *c. all internal register except PC to be set to zero
- d. none of the above

7. even parity check can:

- *a. correct all single errors
- b. detect all even errors
- c. detect all odd errors
- d. correct all odd errors

8. MESFETs are increasingly being used at microwave frequencies. MESFET stands for:

- a. metal semiconductor field effect transistor
- b. modulation emmision storage field effect transistor
- c. minority electron surface field effect transistor
- d. none of the above

- 9.a power density at a distance 'r' from an isotropic source is:
- a.directly proportional to the square of power radiated
 - b.directly proportional to power radiated and inversely proportional to distance 'r' from the point source
 - c.directly proportional to the power radiated and inversely proportional to square of distance 'r' from point source
 - *d.inversely proportional to power radiated and square of distance 'r' from point source

10.the collector-to-emitter voltage VCE in a bipolar small signal transistor in saturation is typically:

- a.2V
- *b.0.2V
- c.1V
- d.1.2V

11.following type of memory needs a periodic refresh to retain data:

- a.SRAM
- *b.DRAM
- c.ROM
- D.PROM

12.monopulse tracking technique is a technique in which

- a.extremely low PRT is used
- *b.angular error signal is extracted corresponding to each individual pulse
- c.active tracking technique are restored to
- d.antenna remains stationary over the pulse duration

13.in a 2 input, TTL NAND gate, if one input is connected to logic 1 and other input is connected to output, we will observe:

- a.logic 1
- b.logic 0
- *c.oscillations of 1 and 0 states
- c.none

14. a tuned circuit is used as a filter at the output of RF amplifier developing 0dBm across 50 ohms assuming the loaded Q of the tuned circuit to be 1000,

the RF voltage across the capacitor will be:

- a.100mV rms
- b.5V rms
- c.225V rms
- d.1KV rms

15.cassegrain feed is used with a parabolic reflector to:

- a.increase the gain of the system
- b.increase the beam width of system
- c.allow the feed to be placed at a convenient point

d. improve the impedance matching with the reflector.

16. phenomenon of ground (surface) wave propagation is used in :

- a. very high frequency communication
- b. very low frequency radio communication
- c. microwave frequency radio communication
- d. optical frequency communication

17. a frequency source is to be calibrated by the tank circuit of known Q(1000). A display showing

the frequency response of the tuned circuit allows computation of the 3 dB band width as 1

MHz. The frequency of the source is:

- a. 1 GHz
- b. 1 kHz
- c. 1 MHz
- d. 500 MHz

18. the following program code is for a single address (single operational instruction) computer

with one accumulate register Acc. Assume that there are no overflow's in computation

LOAD C

ADD C

STORE T1

ADD A

STORE T2

LOAD T1

MUL T2

STORE Z

WHICH arithmetic expression is implemented by the above code ?:

- a. $z = 2 * \text{square}(c) * a + 4 * \text{square}(\text{square}(c))$
- b. $z = 2 * \text{square}(c) * (a + \text{square}(c))$
- c. $z = \text{square}(c) (a + \text{square}(c))$
- d. $z = 4 * \text{square}(c) + a$

19. frequency of a pulse source is measured by counting the number of pulses gated by an asynchronous 1 sec gate pulse (1 sec gate pulse is derived from a source with ± 10 ppm accuracy). measurement error will be:

- a. ± 10 ppm
- b. ± 10 ppm ± 1 Hz
- c. ± 10 ppm ± 0.5 Hz
- d. ± 0.5 Hz

20. what will be the value of average length of an ideal variable length encoding for a source with

$$p_0 = 1/2 \quad p_1 = 1/4 \quad p_2 = 1/8 \quad p_3 = 1/8$$

a. 2 bits

- b. > 2bits
- c. < 2 bits
- d. none

21. in the context of integrated circuits PAL stands for :

- a. positive and logic
- b. programmable and logic
- *c. programmable array logic
- d. none

22. cross-over distortion is normally encouraged in:

- a. phase shift oscillator
- b. class-A amplifier
- c. high frequency wide band amplifier
- *d. class-B amplifier

23. a FM pager working at 90 MHz is to be returned to 100 MHz by changing air-cored coil of the tuned circuit. if the orginal coil had 10 turns, the new coil will have:

- a. 20
- b. 12
- *c. 9
- d. 5

24. a co-axial cable having an inner diameter of 0.5mm is using an insulator with a dielectric constant of 2.55. If it has to have characteristic impedance of 50 ohms. then the center conductor diameter should be

- a. 1.5mm
- b. 1.89mm
- c. 2.55mm
- d. 3mm

25. in a 'vectored interrupt' system branching to the service routine:

- a. depends on data supplied by an external source
- b. does not depend on external data
- c. occurs only at power ON time
- d. none

26. ideal band width of pulse radar with 500KW peak power, 1 microsecond pulse width and PRF = 500

- is about
- a. 10MHz
 - b. 1MHz
 - c. 200KHz
 - d. 5MHz

27. the grounded base amplifier stage is used in conjunction with a LC network to realise an oscillator. LC n/w should provide a phase shift of:

- a. 90 degrees
- b. 0
- *c. 180
- d. 30

28. for a given waveguide with dimension 1xb cms., the breakdown voltage of waveguide can be substantially increased by:

- a.changing the wall thickness
- b.changing the wall conductors
- c.pressurising the waveguide
- d.none

29.radiation losses in strip lines are

- a.less than microstrip
- b. higher microstrip
- c. same as microstrip
- d.none

30.emitter coupled logic is some times used in digital circuit because:

- a.they consume less power
- b.they can switch large power
- c.they use minimum components
- d.they can work at higher frequency.

31.a duplexer is used in a system in order to:

- a.double the frequency of operation
- b.double the output power
- c.isolate the transmitter and receiver for simultaneous operation
- d.none

32.an S band Radar operation at 3000 MHz ,PRF 500,pulse width 1 microsec,encounters a radially approaching target closed in at 150 meters/sec. The doppler shift due to target motion is

- a.0 hz
- b. 1500 hz
- c.3000hz
- d.none

33.when a sign wave input is given to an oscilloscope with horizontal sweep off,the oscilloscope will show:

- a.a sine wave
- b. a dot
- c.a horizontal line
- d.a vertical line

35. volatile gain of a grounded collector amplifier is approximately

- a.0.5
- b.1.0
- c.2.0
- d.10.0

36.among the following types of transmitting tubes,which one is not suitable for implementation of fully coherent radar

a.klystron b.TWT c.magnetron d.cross field amplifier(CFA)

37.the effective isotropic radiated EIRP of a given antenna system can be increased by:

- a.increasing the transmission power Pt
- b.increasing the directive gain of the antenna
- c.reducing the feed losses
- d.none

38.the equation $\text{not}(a.b.c.d) = \text{not}(a) + \text{not}(b) + \text{not}(c) + \text{not}(d)$ illustrates

- a.idempotency b.inversion theorem c.de morgan's theorem
- d.none

39. an abundance of 'holes' in a semiconductor indicates that it is :

- a.intrinsic type b.N type c.p type d.mechanically brittle
- e

40.entropy of a message source with 5 symbols is maximum at:

- a. $p_0=p_1=p_2=p_3=p_4=1/4$
- b. $p_0=p_4=1/8 ; p_1=p_2=p_3= 7/24$
- c. $p_0=p_2= 1/8 ; p_1=p_3=p_4=7/24$
- d.none

41.an input power of 17 dBm is incident on a connectorised junction whose VSWR is 2.0. Due to the

effects of mismatch power reflected back at junction is

- a.15dBm b.5.56 mW c.8.5mW d.10mW

42.if the complementary o/p of D-flipflop is connected to the D-input, the resultant circuit will

behave as:

- a.D-flip flop b.JK *c.T d.none

43.a point on a smith chart has an impedance $x+jy$. to know the admittance at this point from the

smith chart, one needs to move from the point along the circumference of the chart for an

angle of

- a.360 degrees b.90 c.180 d.none

44.gray scale is commonly used for:

- a.rotational shaft encoders
- b.alpha-numeric character encoders
- *c.error correcting codes
- d.none

45. the binary number 101.001 is equivalent to decimal number
*a.5.125 b.5.1 c.5.5 d.5.625

46. schmitt trigger gates exhibits a property called
a.inversion *b.hysteresis c.buffering d.negation

47. quarterwave transformers are used to match load impedance to source impedance at a given centre frequency. in order to perfectly match a 100 ohms source to a 50 ohms load, the characteristic impedance of a quarterwave transformer should be:
*a.25 ohms b.150 c.70.0 d.35.5

48.a 256x8 ROM can be thought of as:

- a.256 combinational logic functions with 8 variables
- b.8 combinational logic functions with 8 variables
- c.8 combinational logic functions with 2567 variables.
- d.none.

49.MESFET with aluminium gates are susceptible to burn out due to static discharge. In order to reduce this problem
a.the gate thicknesses are increased
b.aluminium gates are replaced by dielectric gates
c.aluminum is replaced by gold gates
d.none

50.for a material to be a conductor the gap b/w valence and conduction band should be:
a.low b.high c.zero d.not relevant

51.'A' scope is a display in which data presentation is in the form of
a.range Vs target amplitude
b.azimuth Vs range
c.azimuth Vs elevation
d.none

52.no. of coset leaders of standard array constructed for (7,4) hamming code will be:
a.16 b.8 c.4 d.7

53.a electro dynamic instrument which responds to the average value of a wave form is connected across a 220V AC outlet. You expect the meter to read
a.154V b.110V c.198V d.314V

54. pick a coding scheme that has DC power:

- a.manchester
- b.HDBB
- c.AMI
- d.duo binary

55.the 'diode-drop' across a small signal silicon diode is typically:

- a.0.1V
- b.0.2V
- c.0.6V
- d.1.0V

56.A Microstrip line is printed on a substrate of dielectric constant ϵ_r and thickness h . the width of the microstrip line predominantly governs.

- a.power handling capability
- b.impedance characteristics
- c.temperature co-efficient of expansion
- d.frequency of operation

57.the binary number 10111011 is equivalent to decimal number:

- a.273
- b.533
- c.187
- d.167

58.the main advantage of archimedean spiral antennas is:

- a.high gain
- b.narrow beamwidth
- c.wide operating band width
- d.high power handling capability

59.the collector base junction in a common emitter amplifier is

- | | |
|-------------------|------------------|
| *a.reverse biased | b.forward biased |
| c.floating | d.euipotential |

60.a non-maskable interrupt has generally:

- *a.higher priority than maskable interrupts
- b.lower priority than maskable interrupts
- c.equal priority as maskable interrupts
- d.none

61.a full wave rectifier is used to rectify 230V 50Hz main. Its ripple will be:

- | | | | |
|--------|---------|---------|---------|
| a.50hz | b.100hz | c.230hz | d.n one |
|--------|---------|---------|---------|

62.A 250uF capacitor and a 1Mohm resistor are connected to a 48V battery through a switch. After

a lapse of 4 minutes,10 sec, the voltage across capacitor will be

- a.48V
- b.24 V
- c.17.6V
- d.0V

63.in a delta modulator signal to quantisation noise ratio can be maximised by:

- a.by increasing step size and reducing sampling frequency

- b.by increasing step size and sampling frequency
c.by decreasing step size and increasing sampling frequency
d.by decreasing step size and sampling frequency

64.it is proposed to increase the power o/p of a Class A audio amplifier by replacing R-C coupling to transformer coupling. The o/p is expected to increase by

| | | | |
|-------|-------|--------|--------|
| a.25% | b.50% | c.100% | d.300% |
|-------|-------|--------|--------|

65.digital data at 19200 bits/sec is to be transmitted through a modem at a baud rate of 4800 per sec.what would be choice of modulation

| | | | |
|--------|---------|----------------|---------|
| a.BPSK | *b.QPSK | c.16 level QAM | d.n one |
|--------|---------|----------------|---------|

66.in any given family of logic circuits fanout is measure of

| | | | |
|---|--|---|--------|
| a.the number of standard gate inputs that can be driven by a single gate output | b.the number of outputs that can be connected to a standard gate input | c.the number of outputs that can be tied together | d.none |
|---|--|---|--------|

67.it is proposed to construct an oscillator for the high frequency possible with a given transistor

| | | | |
|-----------|-----------|-----------|--------|
| a.CE mode | b.CB mode | c.CC mode | d.none |
|-----------|-----------|-----------|--------|

68.a class 'B' amplifier is a type of amplifier having.

| | |
|----------------------|---|
| a.higher power point | b.high gain |
| c.high efficiency | d.has active devices conducting 50% of the time |

69.for any amplifier, its intercept point is

| | |
|-------------------------------------|---------------------------------|
| a.lower than 1dB compression point | b.same as 1dB compression point |
| c.higher than 1dB compression point | d.none |

70.In PCM a fairly constant signal to quantisation noise ratio over large signal power variation can be maintained by

| | |
|--------------------------------------|---------------------|
| a.adapting logarithmic companding | b.adopting exponent |
| c.adopting larger sampling frequency | d.none |

71. in 'immediate addressing' mode

- a.the effective address is within the instruction
- b.the effective address is within in a register
- c.the effective address has to be computed
- d.none

72. the power fed into a volume is equal to the algebraic sum of electric power dissipated as heat,

pulse reactive power proportional to the difference b/w the time average magnetic and electric energies stored in the volume plus the complex power transmitted across the surface enclosed by the volume . this is the

- a.faraday's law
- b.helmoltz theorem
- c.poynting

theorem d.Gauss law

73. a half-adder circuit can be realised using only

- *a.2-input NAND gates
- b.2-input AND gates
- c.2-input OR gates
- d.none

74. in troposcatter communication systems, Rayleigh fading is caused by:

- a.destructive interference due to multi frequency signals
- b.destructive interference due to multi path signals
- c.interference due to different polarisation
- d.absorption in the troposphere

75. the magnitude of the signal power due to a target at the receiver of a mono-static radar is

- a.directly proportional to the range of the target
- b.inversely proportional to the range of the target
- c.proportional to the $(1/R)^{**3}$, where 'R' is the target range
- d..proportional to the $(1/R)^{**4}$, where 'R' is the target range

76. in a 'P' channel junction FET with gate(G) source(S) & drain(D) electrodes, which of the

following polarities for supply voltage are correct

- | | | | |
|-----------|---------|-----------|---------|
| a.VGS +ve | VDS -ve | b.VGS -ve | VDS +ve |
| c.VGS -ve | VDS -ve | d.VGS +ve | VDS +ve |

77. in pulse code modulation every bit increase in sample digitisation contributes:

- | | |
|-----------------------------|-----------------------------|
| a.a 3dB improvement in S/Nq | b.a 9dB improvement in S/Nq |
| c.a 6dB decrement in S/Nq | d.none |

78. in a radar front end a two stage cascaded amplifier is used. the first stage has a gain of 10dB and a noise figure 1.5db. The second stage has a gain of 17dB and a noise figure of 3dB. the overall cascaded noise figure is then
 a.3.05dB b.4.5dB c.1.55dB d.1.79dB

79. in an 8-bit two's complement representation ,the binary number 11101111 is equivalent to the decimal number
 a.27 *b.-17 c.-25 d.35

80. if a high-order frequency multiplication is required from a diode multiplier, the ideal choice of the diode at radio frequencies would be
 a.schottky point contact diode b.PIN diode
 c.Gunn diode d.step recovery diode

de

81. the permittivity of free space is----

82. in an audio amplifier negative feed back is used to stabilise the gain.the total harmonic distortion produced by the amplifier:
 a.increases with negative feed back
 b.decreases with negative feed back
 c.will remain unchanged
 d.will remain unchanged, but levels of harmonics will relatively vary

83. the product of the two BCD integers 00100011 and 00011000 is the BCD integer:--

84. Morse code system is---

85. charge of an electron is----

86. compared to TTL devices, CMOS devices have
 a.higher DC noise margin b.lower DC noise margin
 c.the same noise margin d.none

87. the equations below illustrate--asssociate law..

88. a fer.ite is
 a.a non-conductor with amagnetic properties
 b.an intermetallic compound with good conductivity
 c.an insulator which attenuates magnetic fields

d.a microwave semiconductor

89.a bipolar transistor,when used as a switch,will be generally working in:

- a.active region only
- b.cut-off region only
- c.active and saturation regions
- *d.cut-off and saturation regions

90.when an analogue signal occupying 0 to f_{max} is sampled at a rate slightly less than $2f_{max}$

- a.lower frequency aliases over lower frequency
- b.higher frequency aliases over lower frequency
- *c.lower frequency aliases over higher frequency
- d. higher frequency aliases over higher frequency

91.the gain bandwidth frequency of a transistor, f ,is the frequency at which

92.a power amplifier with $P_0=16W$ and $Z_0 = 4\Omega$ is to be connected to an array of loudspeakers, 4

columns with two speakers in each column,what would be the best choice:

- *a.8 ohm,4 watt,8 nos.
- b.4 ohm,2 watt,8 nos.
- c.8 ohm,2 watt,8 nos.
- d.none

93.PIN diodes are widely used as

- a.detectors
- *b.switching elements
- c.voltage sensors
- d.current amplifiers

94.modulation method used for picture transmission in TV broadcast is

- a.SSB
- *b.VSB
- c.DSB
- d.DSB-SC

95.Asilicon controlled rectifier can be turned on by pulsing the gate with a high current.It can

be turned 'off' by

a.pulsing the gate again

b.by changing the polarity of the gate pulse

*c.by reversing the anode voltage

d.by reducing the anode voltage

6.In PCM signal to quantisation noise ratio can be improved by

a.increasing sampling frequency

*b.increase of no. of bits

c.decresing sampling frequency

d.none

7.In the context of ionospheric sky wave propagation the critical frequency F_c for a given

ionospheric layer is

a.The lowest frequency that will be returned down to earth that layer after having been beamed straight at it

*b.The highest frequency that will be returned down to earth

y that layer after having

been beamed straight at it

c. That frequency at which polarisation of the wave undergoe drastic change

d. none

The truth table of X-NOR....

In a particular communication system , an amplitude modulation with a single side band and

suppressed carrier has been adopted. If the depth of modulation is 50%, then the percentage

power saving as compared to double side-band full carrier system would be

a. 83.3%

* b. 94.4%

c. 60.5%

d. 5

. In a CMOS device power consumption

a. increase with increasing frequency of operation

b. remains constant at all frequencies of operation

c. decrease with increasing frequency of operation

d. none